DOCUMENT RESUME

ED 477 721 IR 022 001

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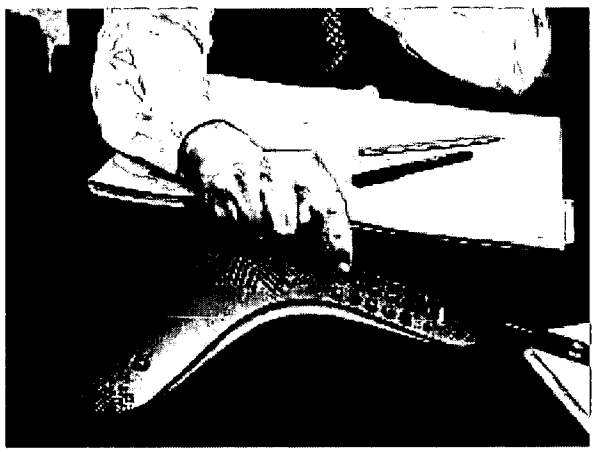
TITLE	Audio/Audioconferencing in Support of Distance Education. Knowledge Series: A Topical, Start-Up Guide to Distance Education Practice and Delivery.
INSTITUTION	Commonwealth of Learning, Vancouver (British Columbia).
PUB DATE	2001-00-00
NOTE	7p.; Contains small print.
AVAILABLE FROM	For full text: http://www.col.org/Knowledge/pdf/KS_audioconferencing.pdf.
PUB TYPE	Guides - Non-Classroom (055) -- Reports - Descriptive (141)
EDRS PRICE	EDRS Price MF01/PC01 Plus Postage.
DESCRIPTORS	Audio Equipment; *Distance Education; *Educational Technology; Electronic Classrooms; Instructional Design; Interaction; Nontraditional Education; Telecommunications; *Teleconferencing
IDENTIFIERS	Audio Classrooms; Audio Intercommunication Systems

ABSTRACT

The main focus of this document is on audioconferencing, which in distance education contexts provides "virtual" interaction equivalent in quality to face-to-face, conventional classroom interaction. The applications of audiotape and audio broadcast are covered only briefly. Discussion first includes reasons for using audioconferencing and types of audioconferencing systems. Tips for effective audioconferencing are then described, covering: planning and preparation; instructional design models; focus on creating dialog; redirecting questions and comments; concluding and following up; evaluating the session; and what audio/audioconferencing can do for distance education. Resources are listed for teaching guides, relevant Web sites, and further research. (AEF)

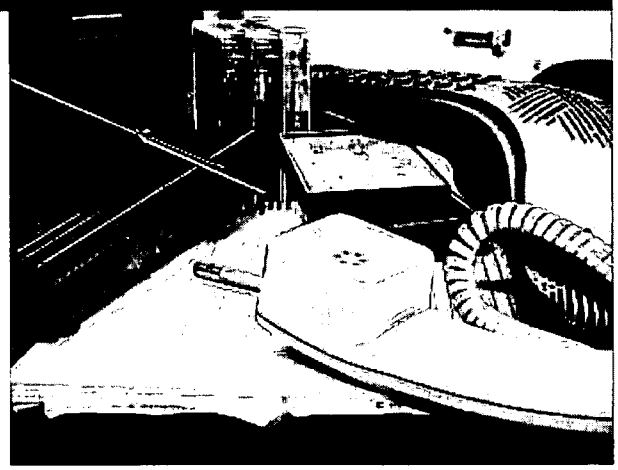


Audio/Audioconferencing in Support of Distance Education

KNOWLEDGE SERIES

Audioconferencing in distance education provides "virtual" interaction equivalent to conventional classroom interaction

Audioconferencing is a well-established teaching technology that is inexpensive, accessible and flexible. It builds learning communities, even where the community is physically dispersed and made up of students from a wide range of backgrounds.



INTRODUCTION

Whilst the latest generation of distance education has brought us a dizzying array of high tech, computer-based education technology and information saturation via the Internet, simple audio and audioconferencing technologies are still effective for teaching and learning in contexts where participants cannot meet for face-to-face discussion and learning.

Audiotapes and broadcasting are low-cost approaches widely used in correspondence study and distance education since the 1970s, as a content delivery alternative to print based materials. The major focus here will be on audioconferencing, which in distance education contexts provides "virtual" interaction equivalent in quality to face-to-face, conventional classroom interaction. The applications of audiotape and audio broadcast will be covered only briefly; those interested for more information in these areas are referred to *Using Community Radio for Non-formal Education* by John Thomas, also in The Commonwealth of Learning's Knowledge Series 2001 (www.col.org/knowledge).

APPLICATIONS FOR AUDIO TAPES AND BROADCAST

Radio broadcasts were an important aspect of many distance education programmes in the past, particularly for the various "schools of the air" such as the University of Wisconsin's in Madison, USA and the schools of the air in Alice Springs and Katherine in Australia (see the "Relevant websites" section at the end of this paper).

Audiotapes are best used to complement a comprehensive print-based package. In this context, audio recording may be considered for:

- Introduction to a segment of content, allowing the teacher to personalise the course package
- Presenting case studies or examples
- Interviews with content experts or to present a variety of perspectives
- Recordings of radio excerpts on current issues
- Student comments, interviews or debates on key issues
- Feedback on activities or assessment tasks
- Clarification of pronunciation in language courses, or where highly technical language is used
- Courses for developing aural communication skills.

Rowntree (1994) provides a useful outline of issues for consideration in developing an audio teaching package. A more comprehensive introduction is The Commonwealth of Learning/International Extension College publication (2001), *Audio for Distance Education and Open Learning: A practical guide for planners and producers,* by John Thomas (www.col.org/audiohandbook).

Audio does have some limitations in comparison to print-based material. Audio programmes are designed for listening to from start to finish, so the student cannot access individual parts of the content out of sequence. Also, the student cannot make notes or highlight sections for review later. For clarity, audio content should ideally be designed in distinct segments, with a defined structure and effective summaries of key points.

If the primary objective is content delivery, audiotapes should be selected over audioconferencing – especially when combined with print materials. Both print-based materials and audiotapes are portable, easy to use, and provide greater flexibility and access than "real time" technologies such as audioconferencing. Although not the most suitable medium for transmitting a lot of detail, the exception is where content needs to be updated; in such cases, the immediacy of audio conferencing can be used to timely effect.

INTRODUCTION TO AUDIOCONFERENCING

WHY USE AUDIOCONFERENCING?

Many of the most common tasks in educational settings (providing information, asking questions, problem-solving) can be done effectively by telephone. The audio medium is accessible, simple and cost effective relative to more sophisticated technology, such as videoconferencing and interactive computer programmes. Audioconferencing is also a learner-centred experience that can be effectively integrated with other media – for example, print and video. Moore (1994) provides an excellent discussion of the advantages of audioconferencing in an editorial for *The American Journal of Distance Education.*

Research suggests that audioconferencing is best suited to interactive work, where tasks are based around the verbal exchanges of participants. To optimise the educational effectiveness of audioconferencing, teaching approaches that enhance its interactive potential must be developed.

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Audioconferencing is a synchronous technology that requires same-time participation, and ideally same-place participation. Students can gather in small face-to-face groups and be linked as groups, rather than as individuals, via the telephone. Audioconferencing adds a level of interaction and discourse to the distance learning environment, although at the cost of some learner independence and flexibility. This trade-off needs to be carefully considered before committing to using audioconferencing as part of any educational programme. There are, of course, alternatives such as email lists and Internet discussion/bulletin boards, which facilitate interaction and discourse without restricting learner independence and flexibility to the same degree.

As with any teaching technology or method, it is crucial to identify up front the rationale for using audioconferencing. By being clear about this, you are well placed to determine how you will use audioconferencing and what your specific objectives for using it are.

TYPES OF AUDIO CONFERENCE SYSTEMS

There are two ways to set up an audioconferencing session. One is to use the conference call services of a commercial telecommunications provider, such as ECI Conference Call Services or Telstra ConferLink (see reference section). Another option is to purchase an audio conference bridging system to facilitate multi-point telephone connections. An example of the latter system is in place at the Australian Taxation Studies Programme (ATAX) at The University of New South Wales in Sydney, Australia. This programme has used audioconferencing since its inception in 1991 as the primary means of communication between teachers and students, dispersed over 20 learning centres across Australia. To support its "national classroom" of daily, course-specific audio conferences throughout the working week, ATAX worked with ADTEC Communications, Australia to customise a telebridge that would meet the programme's teaching requirements.

The system selected to support audioconferencing will depend on the available budget, audioconferencing frequency and the number of participants involved. Any group with access to a reliable telephone connection can be in a conference call at a reasonable cost, without needing any technology apart from a standard telephone. However, where small groups are meeting locally to dial into an audio conference, it is highly desirable to use a good quality speakerphone to ensure excellent sound.

Another possible supplement to audioconferencing is dataconferencing, or audiographic conferencing. This involves connecting computers at each remote site over the Internet to transmit visual data between sites, or to use an interactive, on-screen whiteboard. This increases the technological complexity of audioconferencing, but is helpful in contexts where an interactive visual dimension is beneficial – for example, a programme on agricultural techniques. The use of audiographics may reduce the number of participants who can actively interact in a class, or increase the infrastructure costs significantly. Consider other less expensive options, such as print or video-based supplementary material, where a visual medium is necessary but an *interactive* visual medium not essential.

TIPS FOR EFFECTIVE AUDIOCONFERENCING

PLANNING AND PREPARATION

Many of the wide range of learning activities normally used in face-to-face teaching, if based on verbal exchanges, can be translated into the audio conference environment. The following are some of the kinds of activities you might consider:

- Review and discussion of set activities from course materials
- Set case studies for whole group or small group work
- Student presentations/debates
- Various forms of role play
- Brainstorming activities.

Most of these techniques work best in a situation where students are participating in small groups, rather than individually dialling in from their own telephones. The appropriateness of any specific activity will very much depend on the instructional design model and other parameters you are working within. Some research and analysis into what would work best for your particular situation is needed before starting an audioconferencing project.

INSTRUCTIONAL DESIGN MODELS

I will briefly outline a distinction between a "community of learners" model and an "independent learning support" model (based on the work of Anderson and Garrison, 1995). There are many variations on these two broad models, but they serve as a good starting point to begin developing sound teaching practices in an audioconferencing environment.

The "community of learners" model is based around a core course activity of regular audioconferenced meetings, or "classes." Successful completion of the course is based on participation in these meetings. There may be no directed learning package involved, and course content, assessment and other aspects of the learning experience may be negotiated within the audio conference class structure. This is a learner-based model, appropriate where the course objectives focus on extracting and developing knowledge from within the group rather than on transmitting content from teacher to students.

In contrast, the "independent learning support" model is applicable where audioconferencing supplements the independent study of course work (for example, from a set of printed course materials), and is more teacher-directed. Audioconferencing attendance requirements are likely to be optional, or less frequent, than in the "community of learners" model. Given the supplementary nature of this model, it is likely that the content

OR LECTURER AT THE AUSTRALIAN TAXATION
AT THE UNIVERSITY OF NEW SOUTH WALES IN
AN AUDIO CONFERENCE USING AN IN-HOUSE
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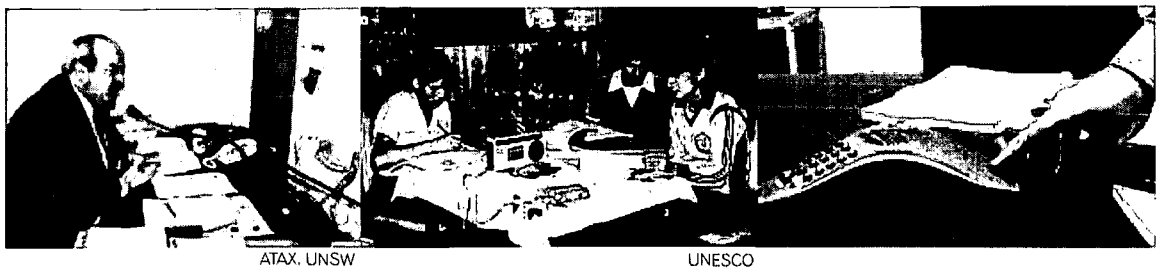

ATAX, UNSW

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and format of each audio conference will focus mainly on reviewing core materials, providing formative feedback to students on their progress and clarifying assessment and evaluation procedures.

The first step in planning an audio conference, or an audioconferencing programme, is to establish its parameters. This involves asking:

- What instructional design model will be adopted?
- Is audioconferencing a compulsory or optional part of the course?
- How many students are expected to participate?
- Where will students be located?
- Will students be dialling in individually or in groups?
- How long will the sessions be?

The answers to the above questions, and of others relevant to individual circumstances, will help determine what activities will be effective. For example, if you were teaching several groups of four to five students each, at a small number of centres, group work activity would be quite feasible. If on the other hand you were dealing with the same number of students, but each was dialling in alone from a separate telephone, group work would be much more difficult to facilitate. Other approaches might then become necessary, such as using print supplementary material or dataconferencing with an interactive whiteboard.

FOCUS ON CREATING DIALOGUE

As audioconferencing is an exclusively audio environment, verbal exchange is the key to successful teaching and learning. A sound questioning technique is an important part of good teaching in any setting, but it is absolutely crucial in audioconferencing. In my own experience, I have found that teachers using audioconferencing often become aware of weaknesses in their questioning technique. The experience assists them to generally become better teachers.

Effective questioning involves using both "open" questions, which invite a range of different answers and are relatively broad in focus, and "closed" questions, which seek a specific correct/incorrect answer. Effective questioning will also redirect answers to other students and build dialogue among participants, based on their responses. The effective questioner will rarely find it necessary to follow the Socratic tradition of providing the answers to a posed question.

Starting off with open questions is best, as these are likely to be inclusive of most students. The group can then work collectively towards answering more complex, closed questions. Open questions will "warm up" the students and help them work as a group, rather than being a passive majority listening to the contributions of more confident participants.

REDIRECTING QUESTIONS AND COMMENTS

Avoid turning your audio conference into a teacher-student, "Q&A" session. You should be trying to create discussion between students, rather than a series of interactions between yourself and individual students.

Wherever possible, rather than responding directly to an individual comment you might ask the rest of the group whether they agree or disagree with the point being made. If a particular student is floundering, seek assistance from other students rather than answering the question yourself. It is often less intimidating for students to work through issues with other students, than with the authority figure of the teacher/facilitator. By directing the question to the group, you may discover it is one that several students are having difficulty with – which is important for you to know, and reassuring for the student in the spotlight.

Consider the following pointers for questioning technique:

- *Respond to contributions positively*: acknowledge all input from participants; don't ignore anyone's contribution.
- *Ask for "raised hands"*: use an "interruption protocol," the equivalent of raising hands in a face-to-face group, by which students indicate they wish to say something. A good way is for the teacher to ask for students wishing to contribute to simply state their names.
- *Respond to answers with more questions*: in doing so, it is not necessary to affirm whether each comment is correct or incorrect.
- *Don't rush students to the solution*: thinking time seems much longer when audioconferencing, but bear with the uncomfortable silences and allow a reasonable amount of time for students to consider a question or problem.
- *Don't answer your own questions*: instead, clarify the thinking process you are looking for, suggest how the question might be approached, or even provide a couple of possible answers that students might choose from.
- *Use small group discussion for complex problems*: it is much more comfortable for students to have a few minutes to work through a complex problem with other students before volunteering an answer.
- *Move from the foreground to the background as the discussion proceeds*: plant "seed" questions so that the group may develop its own ideas.
- *Control the dominant participant*: manage the interaction to prevent one or two participants from dominating the discussion.

You should have a very clear plan for the audio conference. What you intend to cover and what students can expect to learn should be stated at the outset of the session. The teacher must frame the discussion (give it context), and emphasise key points and expected outcomes. I would suggest that in an excellent audio conference, most of the talking should be coming from the students while the teacher provides encouragement and guidance.

CONCLUDING AND FOLLOWING UP

In concluding the session, you should always return to the session's objectives and pull together the threads of discussion to provide some clear outcomes. You can establish with the students if they feel they have accomplished what you set out to achieve, simply by asking them. This process can help identify any areas that were not adequately covered and suggest alternative ways to deal with them (possibly, by returning to them in the next session). You may also

be able to identify individual students who have particular difficulties, and arrange to deal with them one-on-one outside of the group session.

Each session should be a coherent part of the overall programme. Relate what you have covered in each session to previous work in the course, and/or earlier audio conferences (e.g., how has this session built on and extended the students' learning?). Then look forward to where students should be going next, and offer an overview of what will be covered in the next session (if there is one).

EVALUATING YOUR SESSION

As with any teaching method, obtaining constructive criticism from your students is an important part of the teaching and learning process. Evaluation forms are a valuable source of information, but the type you use must depend on the teaching and learning situation and the kind of data you need to collect.

If your organisation regularly uses audioconferencing, there will no doubt be evaluation questionnaires already available. You should investigate these and see if you think they are appropriate for your purposes. Alternatively, you may be able to devise your own questionnaire. Determine what aspects of your teaching you would like feedback on. Try to keep the questionnaire format brief and to the point. Be wary of using questionnaires designed for face-to-face teaching for your audio conference teaching, as they may be inappropriate.

WHAT CAN AUDIO/AUDIO CONFERENCING DO FOR DISTANCE EDUCATION?

The use of an audio medium adds variety to course presentation, and accordingly helps support a broader range of learning styles and preferences. Audiotapes and broadcasts also bring a human element to course presentation for the distance education learner; for some teachers and students, it is easier to convey emotion and personality via the spoken word rather than the written word. Needless to say, in situations where sound or spoken language is central to learning objectives (e.g., foreign language or music instruction), the use of audio technologies is crucial for distance learning.

Audioconferencing is a well-established teaching technology that is inexpensive, accessible and flexible. Students who learn at a distance can engage in real-time discourse with teachers and fellow students. Audioconferencing builds learning communities, even where the community is physically dispersed and made up of students from a wide range of backgrounds.

Whilst there is much enthusiasm for the opportunities currently provided by computer-based technologies, these require a certain level of technical skill from both teacher and student as well as access to relatively expensive resources. From my experience, there are a number of both teachers and students who find computer-mediated communications isolating and impersonal, and who prefer the opportunity to meet via telephone. I would suggest that in comparison to computer-mediated, online, real time "chat," audioconferencing is still a superior means of synchronous communication in a learning environment.

For the present, the real advantage of computer-mediated communications may be in providing an interactive forum for discussion between students and teachers through asynchronous discussion/bulletin boards. This eliminates the need for real time participation, increases learner flexibility and expands the options for interaction and discourse. The future will most likely see a convergence of audioconferencing teaching with online technologies. Using both together retains the spontaneity and personality of audioconferencing, while adding an effective interactive visual medium and a means for transmitting data via the Internet.

REFERENCES

The first two sections list a range of online resources, with examples of audioconferencing methods and technologies as well as teaching assistance for effective audioconferencing learning environments. The last section lists more academic publications for anyone wishing to conduct further research on audio and audioconferencing, with links where available to online abstracts or full copies of the articles.

TEACHING GUIDES

Barron, A. (1999) "Audio/Voice Technologies." Chapter 7. *A Teacher's Guide to Distance Learning*. Florida Centre for Instructional Technology, College of Education, University of South Florida.
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RELEVANT WEBSITES

ADTEC Communications: conference calling services.
www.adtec.com.au

Alice Springs School of the Air
www.assoa.nt.edu.au

ATAX (Australian Taxation Studies Programme) Online
www.atax.unsw.edu.au

ECI Conference Call Services
www.callecl.com

ICS (Instructional Communications Systems): Speakerphone rental and purchase information.
www.uwex.edu/ics/other/rental

Katherine School of the Air
www.ksa.nt.edu.au

Learning Network, Queensland. audiographic conferencing.
www.lnq.net.au/ageconference/ageconference.htm

Telstra ConferLink: telephone conference calling
www.telstra.com.au/conferlink

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AUDIO/AUDIOCONFERENCING IN SUPPORT OF DISTANCE EDUCATION

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The Knowledge Series is a topical, start-up guide to distance education practice and delivery. New titles are published each year.
Series editor: Grace Chin
Series designer: Alex Hennig
All web references and links in this publication are accurate at press time.

COL is an intergovernmental organisation created by Commonwealth Heads of Government to encourage the development and sharing of open learning and distance education knowledge, resources and technologies.

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